

For many things in life, such as an examination grade, the difference between 1 percent and 2 percent may not be important. However, for population the difference is critical. Very small changes in the NIR dramatically affect the size of the population, because the base population from which we derive the percentage is so high. For example, when we multiply the NIR of 1.2 percent by the 2006 global population of 6.6 billion, the result is an addition of 80 million people per year. If the NIR immediately dropped to 1.0 percent, world population would increase by 66 million per year, but if it increased to 2.0 percent, world population would increase by 132 million.

The rate of natural increase affects the doubling time, which is the number of years needed to double a population, assuming a constant rate of natural increase. At the early twenty-first-century rate of 1.2 percent per year, world population would double in about 54 years. Should the same NIR continue through the twenty-first century, global population in the year 2100 would reach 24 billion.

When the NIR was 2.2 percent back in 1963, doubling time was 35 years. Had the 2.2 percent rate continued until 2000 instead of declining to 1.3 percent, Earth's population today would be a half billion higher. A 2.2 percent NIR through the twenty-first century would have produced a total population of more than 50 billion in 2100. On the other hand, should the NIR immediately decline to 1.0, doubling time would stretch out to 70 years, and world population in 2100 would be only 15 billion.

Virtually 100 percent of the natural increase is clustered in LDCs. The NIR exceeds 2.0 percent in most countries of Africa, Asia, Latin America, and the Middle East, whereas it is negative in Europe, meaning that in the absence of immigrants, population actually is declining (Figure 2-7). About two-thirds of the

world's population growth during the past decade has been in Asia, with the remaining one-third divided about equally among sub-Saharan Africa, Latin America, and the Middle East.

Regional differences in NIRs mean that most of the world's additional people live in the countries that are least able to maintain them. To explain these differences in growth rate, geographers point to regional differences in fertility and mortality rates.

Fertility

The world map of CBRs (Figure 2-8) mirrors the distribution of NIRs (compare with Figure 2-7). As was the case with NIRs, the highest CBRs are in sub-Saharan Africa, and the lowest are in Europe. Many sub-Saharan African countries have a CBR over 40, whereas many European countries have a CBR below 10.

Geographers also use the total fertility rate (TFR) to measure the number of births in a society. The TFR is the average number of children a woman will have throughout her childbearing years (roughly ages 15 through 49). To compute the TFR, scientists must assume that a woman reaching a particular age in the future will be just as likely to have a child as a woman of that age today. Therefore, the CBR provides a picture of a society as a whole in a given year, whereas the TFR attempts to predict the future behavior of individual women in a world of rapid cultural change.

The TFR for the world as a whole is 2.7, and, again, the figures vary between MDCs and LDCs. The TFR exceeds 5 in many countries of sub-Saharan Africa, compared to two or less in every European country (Figure 2-9).

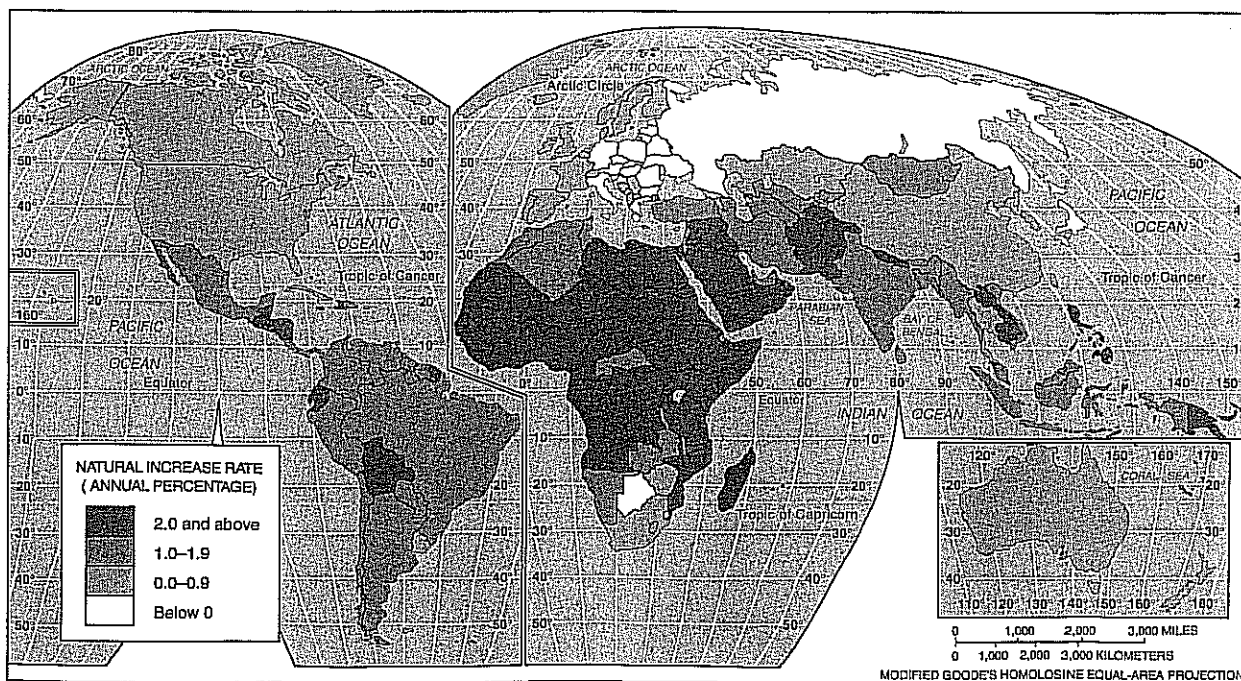


FIGURE 2-7 Natural increase rate (NIR). The natural increase rate is the percentage by which the population of a country grows in a year. The world average is currently about 1.5 percent. The countries with the highest natural increase rates are concentrated in Africa and Southwest Asia.

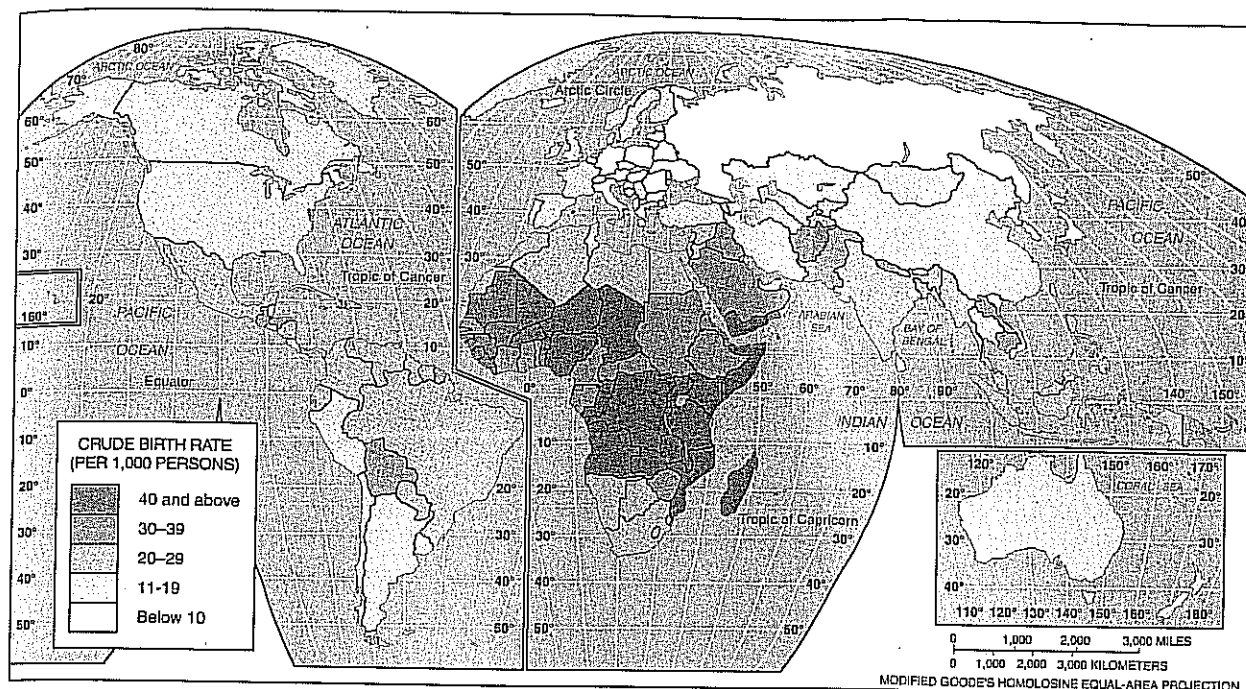


FIGURE 2-8 Crude birth rate (CBR). The crude birth rate is the total number of live births in a year for every 1,000 people alive in the society. The global distribution of crude birth rates parallels that of natural increase rates. Again, the highest crude birth rates are found in sub-Saharan Africa and the Middle East, whereas the lowest are in Europe.

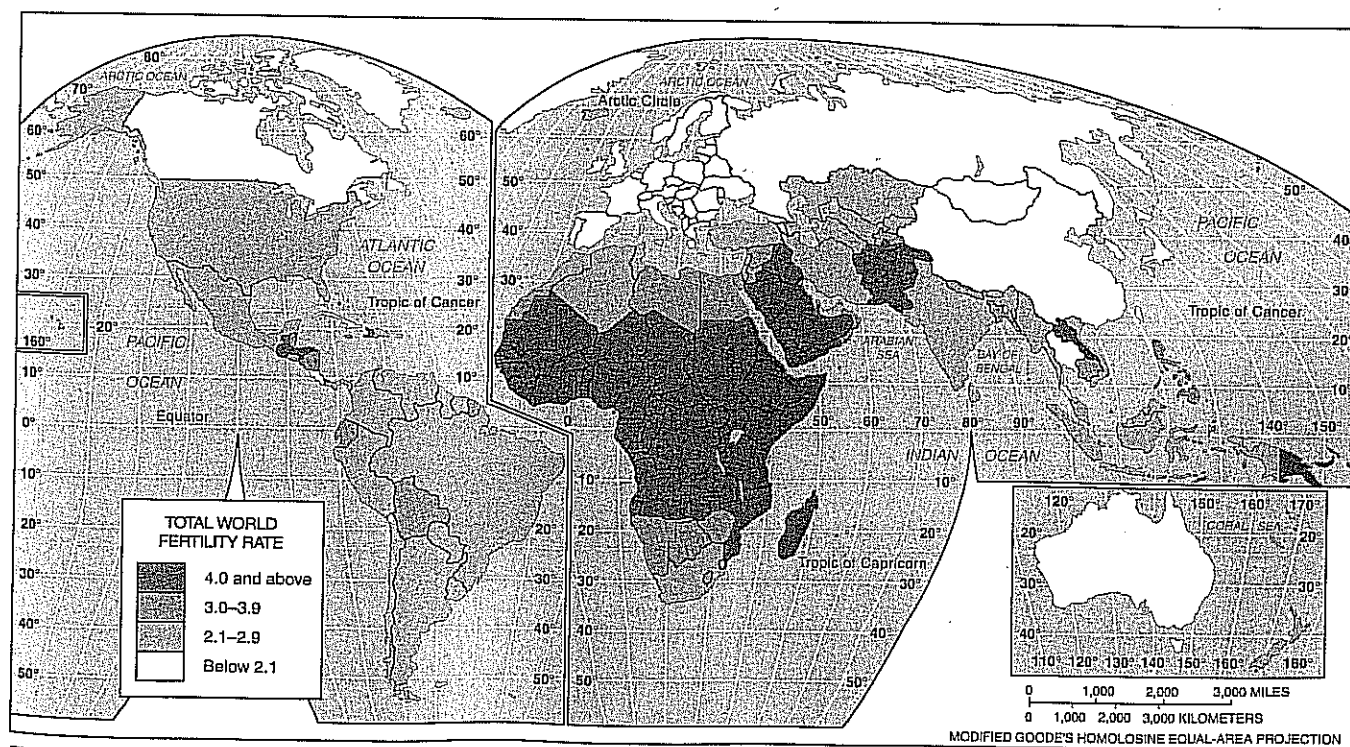


FIGURE 2-9 Total fertility rate (TFR). Total fertility rate is the number of children a woman will have throughout her childbearing years. Again, the highest rates are in sub-Saharan Africa and the Middle East, whereas the lowest are in Europe.

Mortality

Two useful measures of mortality in addition to the CDR already discussed are the infant mortality rate and life expectancy. The **infant mortality rate (IMR)** is the annual number of deaths of infants under 1 year of age, compared with

total live births. As was the case with the CBR and CDR, the IMR is usually expressed as the number of deaths among infants per 1,000 births rather than as a percentage (per 100).

The global distribution of IMRs follows the pattern that by now has become familiar. The highest rates are in the poorer countries of sub-Saharan Africa, whereas the lowest rates are in

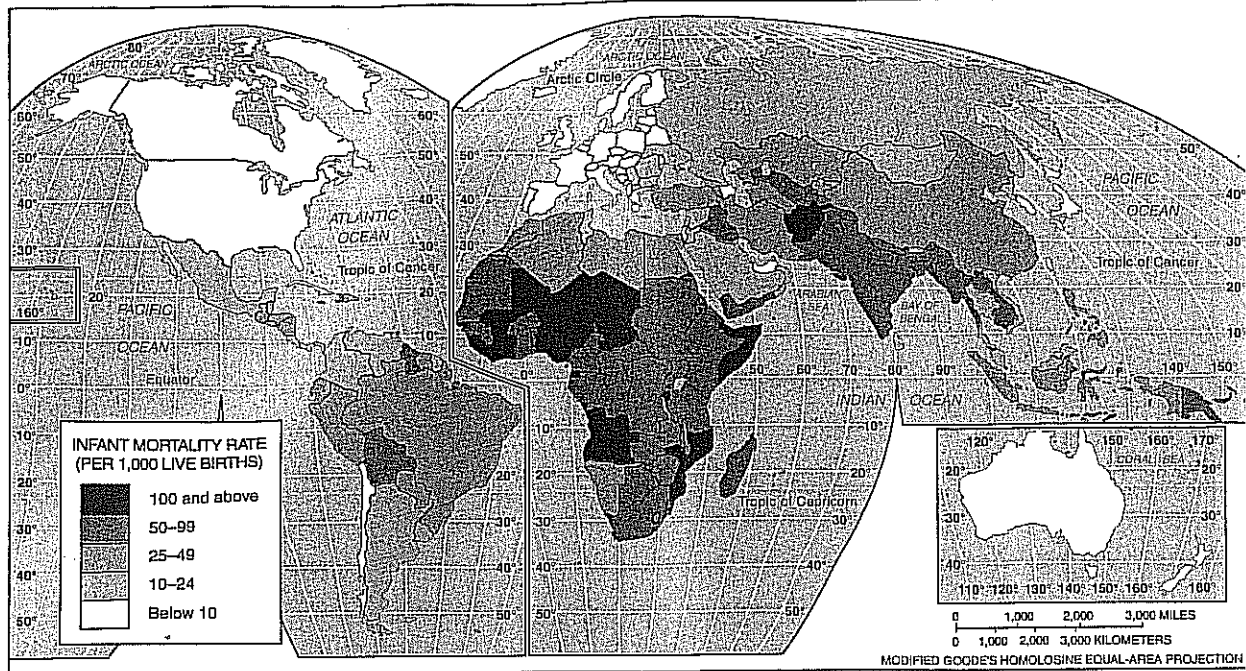


FIGURE 2-10 Infant mortality rate (IMR). The infant mortality rate is the number of deaths of infants under age 1 per 1,000 live births in a year. European and North American countries generally have infant mortality rates of under 10 per 1,000, whereas rates of more than 100 per 1,000 are common in Africa.

Western Europe. IMRs exceed 100 in much of Africa, meaning that more than 10 percent of all babies die before reaching their first birthday. The IMR is less than 5 percent throughout Western Europe (Figure 2-10).

In general, the IMR reflects a country's health-care system. Lower IMRs are found in countries with well-trained doctors

and nurses, modern hospitals, and large supplies of medicine. Although the United States is well endowed with medical facilities, it suffers from a higher IMR than Canada and every country in Western Europe. African Americans and other minorities in the United States have IMRs that are twice as high as the national average, comparable to levels in Latin America and

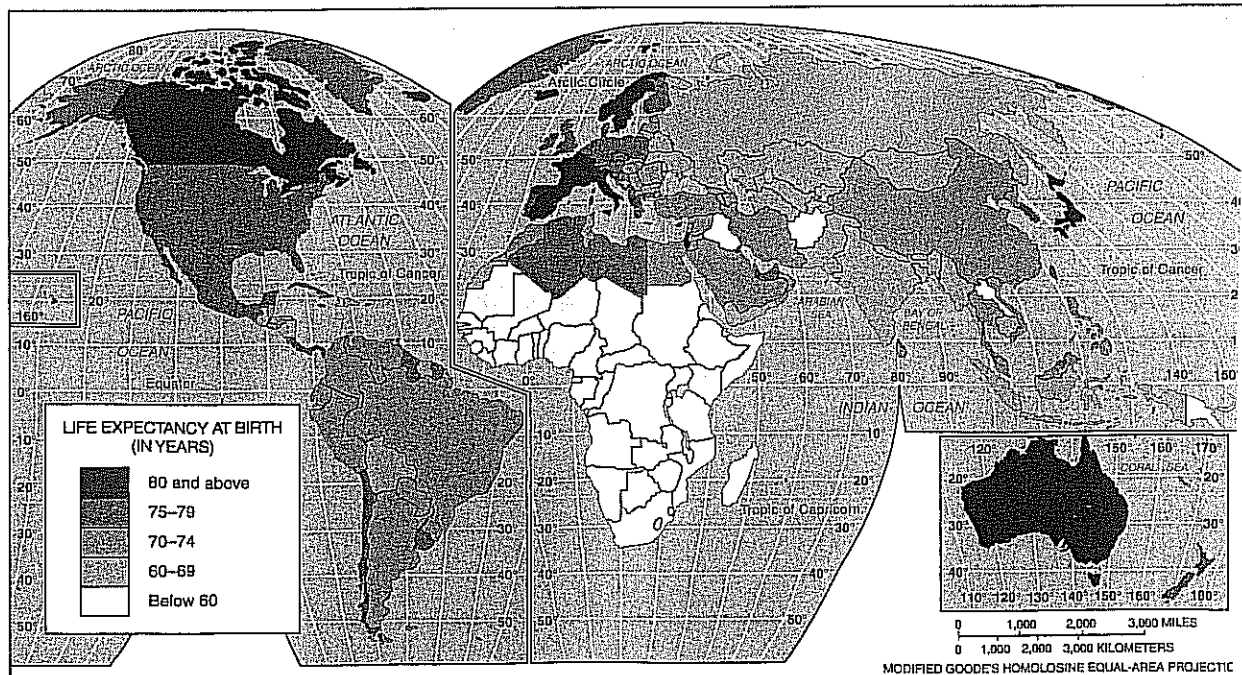


FIGURE 2-11 Life expectancy at birth. Life expectancy at birth is the average number of years a newborn infant can expect to live. Babies born this year are expected to live until their mid-sixties. Life expectancy for babies, however, ranges from the low forties in several African countries to the late seventies in much of Europe, Australia, North America, and Japan.